SH2101
HIGH VOLTAGE DRIVER
HYBRID CIRCUITS

GENERAL DESCRIPTION - The Fairchild SH 2101 Hybrid High-Voltage Driver consists of an Integrated 4-input Milliwatt RTμL Gate driving a High-Voltage Transistor.

- 100 VOLT OUTPUT-CAN SINK TO 10 mA
- INPUT COMPATIBLE WITH µL, MILLIWATT RTµL, DTµL, AND CTµL
- FULL -55°C TO +125°C TEMPERATURE OPERATION
- APPLICATIONS INCLUDE NEON BULB AND GAS READOUT TUBE DRIVER AND HIGH VOLTAGE INTERFACING

ABSOLUTE MAXIMUM RATINGS (25°C Free Air Temperature)

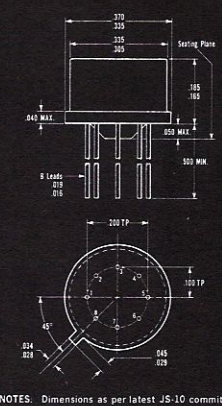
Maximum Voltage Applied to Pin 8 (continuous)	+8.0 Volts
Maximum Voltage Applied to any Input Pin (continuous)	± 4.0 Volts
Maximum Voltage Applied to Pin 6 (continuous)	+100 Volts
Maximum Voltage Applied to Pin 8 (pulsed $\leq$ 1 second)	+12 Volts
Maximum Storage Temperature	-65°C to +150°C
Maximum Operating Temperature	-55°C to +125°C
Maximum Power Dissipation	250 mW

OPERATING VOLTAGE RANGE

V_{CC} (Pin 8) = +3.0 ±10% to +4.0 ±10% Volts

V_H (Pin 6) < +100 Volts

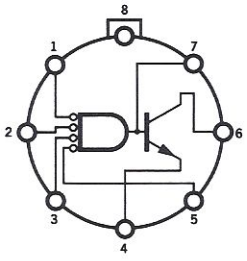
PHYSICAL DIMENSIONS
(SIMILAR TO TO-5)



NOTES. Dimensions as per latest JS-10 committee.
All dimensions in inches.
Leads are gold-plated kovar.
Package weight is 1.12 grams.

PART NO. HXK2101TXX
T=1 FOR -55°C TO +125°C TEMP. RANGE
T=9 FOR 0°C TO +70°C TEMP. RANGE

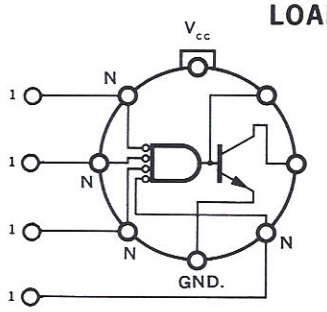
LOGIC SYMBOL



NEGATIVE LOGIC: 6 = 1 • 2 • 3 • 5
POSITIVE LOGIC: 6 = 1+2+3+5

PIN 7 IS AN EXPANDER INPUT. ADDITIONAL PAIRS OF INPUTS MAY BE ADDED USING THE MILLIWATT RTμL EXPANDER, FOLLOWING THE LOADING RULES SHOWN ON THE MILLIWATT RTμL 921 DATA SHEET.

LOAD CHART



DRIVEN BY	N (EQUIV. INPUT LOAD)
MILLIWATT RTμL	1
μL	1/3
CTμL	1/3

DRIVEN BY	NO. OF SH-2101 ALLOWED
DTμL GATE	3 MAX WITH NO DTμL FANOUT
BUFFER	10 MAX WITH NO DTμL FANOUT
	1 MAX WITH SPECIFIED DTμL FANOUT

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

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Test No.	Test Title	Units	TEST CONDITIONS Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	TEST LIMITS Min.	Typ.	Max.
1	I_1	mA	V_{IN}	V_{BOT}	V_{BOT}	GND	V_{BOT}			V_{CC}			I_{IN}
2	I_2	mA	V_{BOT}	V_{IN}	V_{BOT}	GND	V_{BOT}			V_{CC}			I_{IN}
3	I_3	mA	V_{BOT}	V_{BOT}	V_{IN}	GND	V_{BOT}			V_{CC}			I_{IN}
4	I_5	mA	V_{BOT}	V_{BOT}	V_{BOT}	GND	V_{IN}			V_{CC}			I_{IN}
5	V_6	mV	V_{OFF}	V_{OFF}	V_{OFF}	GND	V_{OFF}	I_{OL}		V_{CC}			V_{OL}
6	I_6	μA	V_{ON}	GND	GND	GND	GND	V_H		V_{CC}			I_{OX}
7	I_6	μA	GND	V_{ON}	GND	GND	GND	V_H		V_{CC}			I_{OX}
8	I_6	μA	GND	GND	V_{ON}	GND	GND	V_H		V_{CC}			I_{OX}
9	I_6	μA	GND	GND	GND	GND	V_{ON}	V_H		V_{CC}			I_{OX}
10	t_{1-6-}	nsec	Pulse in	GND	GND	GND	GND	Pulse out		V_{CC}			200
11	t_{1+6+}	nsec	Pulse in	GND	GND	GND	GND	Pulse out		V_{CC}			160

DC TEST LIMITS		-55°C	+25°C	+125°C
V_{CC}	V	3.00 ±0.01	3.00 ±0.01	3.00 ±0.01
V_{BOT}	V	1.80 ±0.01	1.80 ±0.01	1.80 ±0.01
V_{IN}	mV	970 ±2	805 ± 2	590 ± 2
V_{ON}	mV	935 ±2	750 ± 2	555 ± 2
V_{OFF}	mV	650 ±2	450 ± 2	260 ± 2
I_{IN}	μA	125	130	110
V_H	V	100 ± 1	100 ± 1	100 ± 1
V_{OL}	mV	220	220	320
I_{OX}	μA	5	5	40
I_{OL}	mA	10 +0.1	10 + 0.1	10 + 0.1

SYMBOLS AND DEFINITIONS

V_{CC} Supply Voltage

V_{ON} Minimum threshold voltage which will insure an off output transistor.

V_{IN} Input voltage used to measure maximum I_{IN} required to define fan-in.

V_{BOT} Voltage level sufficient to insure full saturation of remaining input transistors for measurement of worst case input loading.

V_{OFF} The maximum voltage which may be applied to an input terminal without turning on the transistor.

I_{IN} The current drawn from the V_{IN} supply by one input of a gate with a fan-in of two or more.

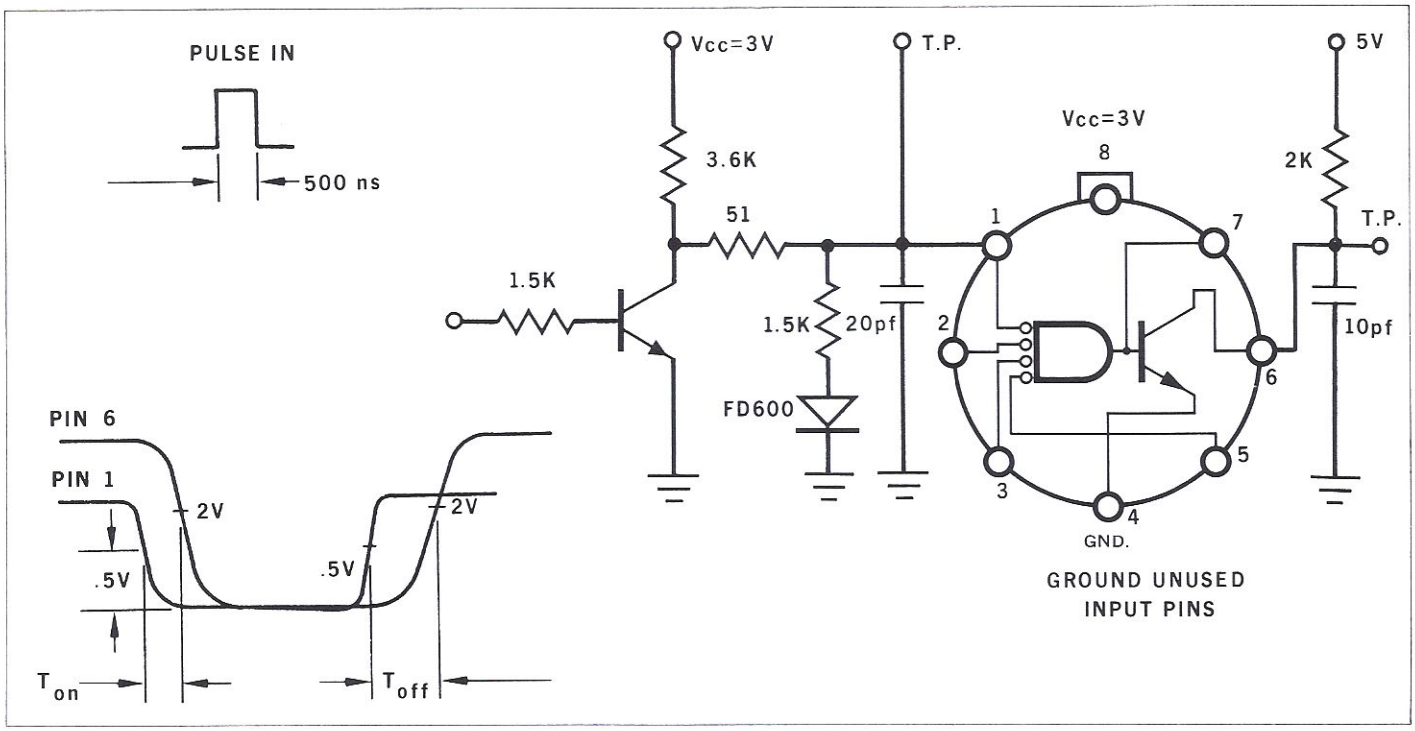
V_{OL} Maximum saturated output voltage when V_{OFF} voltage is applied at all inputs and I_{OL} is supplied to output collector.

I_{OX} Collector leakage current when V_{ON} is applied to one input and V_H is applied to output collector.

I_{OL} Output transistor collector current.

V_H Voltage applied to output collector to measure I_{OX}.

SWITCHING TIME TEST CIRCUIT



TYPICAL ELECTRICAL CHARACTERISTICS

FIG. 1
TYPICAL SWITCHING TIMES

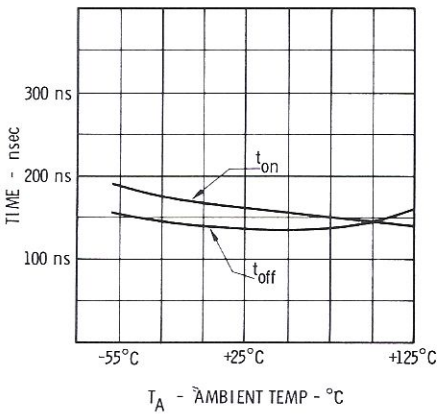
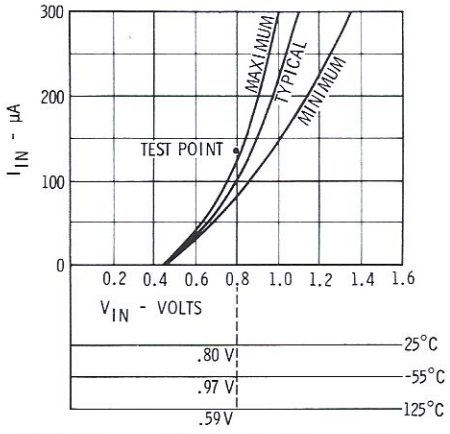
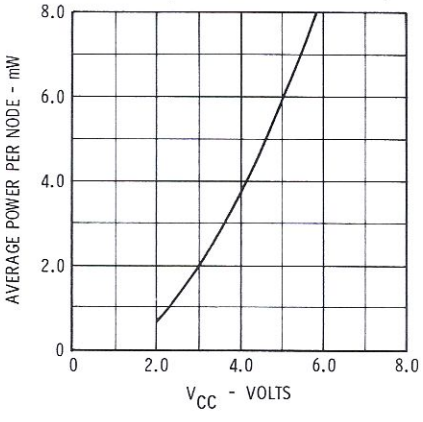


FIG. 2
TYPICAL INPUT CHARACTERISTICS

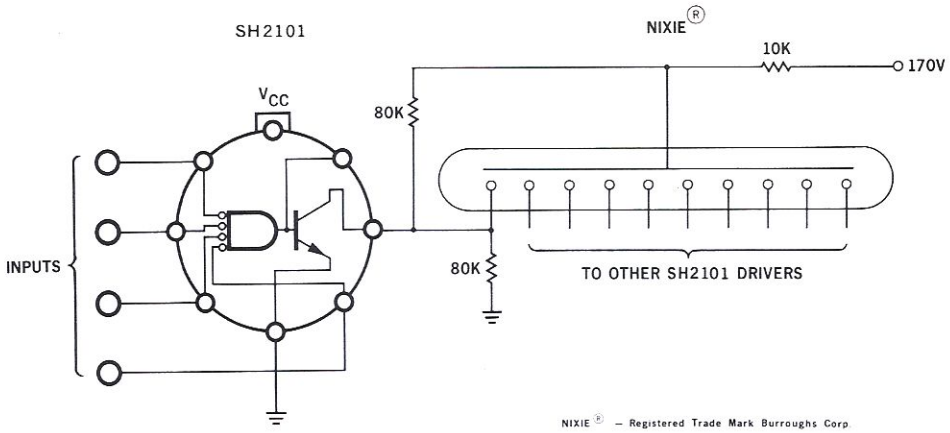


NOTE: This curve will apply as V_{CC} is increased from 3V to 5V with small decrease in I_{IN} for same V_{IN}.

FIG. 3
TYPICAL POWER DISSIPATION VS. V_{CC} (FOR OPEN OUTPUT)



TYPICAL APPLICATION



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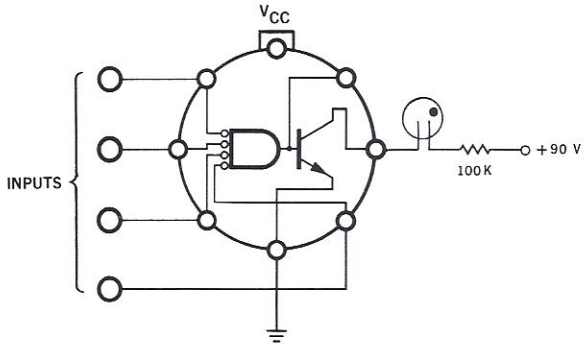
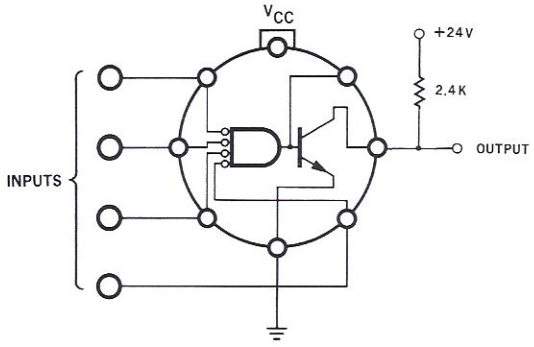


NEON GLOW LAMP DRIVER

NOTE: LAMP LIGHTS ONLY
WHEN ALL INPUTS ARE LOW



INTERFACE GATE — MICROLOGIC TO 24 VOLT LOGIC

NOTE: FOR 12 VOLT CIRCUITS —
USE 1.2K RESISTOR AND +12 VOLT SUPPLY
FOR DTμL AND TTμL CIRCUITS
USE 2K RESISTOR AND +5 VOLT SUPPLY

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